AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

<u>LISTING OF CLAIMS</u>

1. – 2. (cancelled)

3. (currently amended) <u>An image data analysis method for inspecting pads of electronic devices, the method comprising:</u>

    <u>acquiring an image corresponding to a pad;</u>

    <u>generating binarized image data from the image;</u>

    <u>generating a list of dark regions from the binarized image;</u>

    <u>selecting at least one dark region from the list of dark regions;</u>

    <u>generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;</u>

    ~~The image data analysis method of claim 1 wherein the step of generating edge data further comprises:~~

    positioning a geometric mask at a plurality of mask positions tangent to the edge data; ~~and~~

    pruning the at least one dark region of at least a portion of ~~boundary description~~ <u>the binarized image data</u> not contained by the mask positions<u>; and</u>

    <u>computing a boundary description of the at least one dark region using the binarized image data and the edge data.</u>

4. (original) The image data analysis method of claim 3 wherein the geometric mask is circular.

5. (original) The image data analysis method of claim 3 further comprising the application of a fuzzy threshold according to an aspect ratio of the at least one dark region for limiting the pruning step.

6. (currently amended) ~~The image data analysis method of claim 1 further~~ <u>An image data analysis method for inspecting pads of electronic devices, the method comprising:</u>

acquiring an image corresponding to a pad;

generating binarized image data from the image;

generating a list of dark regions from the binarized image:

selecting at least one dark region from the list of dark regions;

generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

generating a first elliptical representation of an extremal end of the at least one dark region;

generating a second elliptical representation of a subset of the edge data corresponding to a region adjacent to both sides of the extremal end of the at least one dark region;

generating a third elliptical representation of the edges used in the first and second elliptical representations;~~-and~~

pruning the at least one dark region in response to a comparison of the first elliptical representation, the second elliptical representation and the third elliptical representation; and

computing a boundary description of the at least one dark region using the binarized image data and the edge data.

7. (original) The image data analysis method of claim 6 wherein the step of pruning the at least one dark region further comprises:

calculating a fit error of the first elliptical representation and a fit error of the second elliptical representation and a fit error of the third elliptical representation; and

pruning the at least one dark region using the elliptical representation having a minimum fit error.

8. – 17. (cancelled)

18. (currently amended) An image data analysis system comprising: ~~The system of claim 17 wherein the processor further comprises a~~

a camera;

a machine vision processor coupled to the camera, the processor and the camera configured to acquire an image corresponding to a region of inspection;

means for generating binarized image data from the image;

means for generating a list of dark regions from the binarized image data;

means for selecting at least one dark region from the list of dark regions;

means for generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

means for heuristic refinement of the binarized image data and the edge data; and

means for computing a boundary description of the at least one dark region using the binarized image data and the edge data;

means for positioning a geometric mask at a plurality of mask positions, the mask positions tangent to the edge data in the image, image; and

a means for pruning the at least one dark region of at least a portion of the boundary description not contained by the mask positions.

19. (original) The system of claim 18 further comprising a means for applying a fuzzy threshold according to an aspect ratio of the at least one dark region for limiting the pruning means.

20. (currently amended) An image data analysis system The system of claim 15 further comprising:

means for acquiring an image corresponding to a region of inspection;

means for generating binarized image data from the image;

means for generating a list of dark regions from the binarized image data;

means for selecting at least one dark region from the list of dark regions;

means for generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

means for generating a first elliptical representation of an extremal end of the at least one dark region;

means for generating a second elliptical representation of a subset of the edge data corresponding to a region adjacent to both sides of the extremal end of the at least one dark region;

means for generating a third elliptical representation of the edges used in the first and second elliptical representations; and

means for pruning the at least one dark region in response to a comparison of the first elliptical representation, the second elliptical representation and the third elliptical representation; and

means for computing a boundary description of the at least one dark region using the binarized image data and the edge data.

21. (original) The system of claim 20 further comprising:

means for calculating a fit error of the first elliptical representation and a fit error of the second elliptical representation and a fit error of the third elliptical representation, and;

means for pruning the at least one dark region using the elliptical representation having a minimum fit error.

22. – 27. (cancelled)

28. An image data analysis method for inspecting scenes, the The image data analysis method of claim 27 wherein the step of generating edge data further comprises comprising:

acquiring an image of a scene;

generating binarized image data from the image;

generating a list of dark regions from the binarized image;

selecting at least one dark region from the list of dark regions;

generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

positioning a geometric mask at a plurality of mask positions tangent to the edge data; and

pruning the at least one dark region of at least a portion of boundary description the binarized image data not contained by the mask positions; and

computing a boundary description of the at least one dark region using the binarized image data and the edge data.

29. (original) The image data analysis method of claim 28 wherein the geometric mask is circular.

30. (original) The image data analysis method of claim 28 further comprising the application of a fuzzy threshold according to an aspect ratio of the at least one dark region for limiting the pruning step.

31. An image data analysis method for inspecting scenes, the ~~The image data analysis method of claim 27 further~~ comprising:

acquiring an image of a scene;

generating binarized image data from the image;

generating a list of dark regions from the binarized image;

selecting at least one dark region from the list of dark regions;

generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

generating a first elliptical representation of an extremal end of the at least one dark region;

generating a second elliptical representation of a subset of the edge data corresponding to a region adjacent to both sides of the extremal end of the at least one dark region;

generating a third elliptical representation using the edged from the first and second elliptical representations; and

pruning the at least one dark region in response to a comparison of the first elliptical representation, the second elliptical representation, and the third elliptical representation; and

computing a boundary description of the at least one dark region using the binarized image data and the edge data.

32. (original) The image data analysis method of claim 31 wherein the step of pruning the at least one dark region further comprises:

calculating a fit error of the first elliptical representation and a fit error of the second elliptical representation and a fit error of the third elliptical representation; and

pruning the at least one dark region using the elliptical representation having a minimum fit error.

33. – 37. (cancelled)